

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

---

*Ex parte* TERRY LOUGHRIN, JOHN ZUBIK, and  
WILHELM SCHOTT

---

Appeal 2007-0422  
Application 09/943,685  
Technology Center 3600

---

Decided: April 12, 2007

---

Before ANITA PELLMAN GROSS, JENNIFER D. BAHR, and STUART S. LEVY, *Administrative Patent Judges*.

BAHR, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Terry Loughrin et al. (Appellants) appeal under 35 U.S.C. § 134 from the Examiner's decision rejecting claims 1-11, the only pending claims. We have jurisdiction over this appeal under 35 U.S.C. § 6.

Appellants invented “a drive shaft coupling including a rotational range of ‘free-motion’ for interconnecting a driving component and a driven component” (Specification [0001]). Claim 1, the only independent claim, reads as follows:

1. A drive shaft assembly for interconnecting a driving component of an agricultural machine and a driven component of an agricultural implement, comprising:
  - a first shaft;
  - a second shaft engaging said first shaft for enabling torque transmission without relative rotational movement and enabling relative axial sliding motion therebetween; and
  - a joint component of a universal joint operably interconnecting one of said first and second shafts to one of the agricultural driving and driven components, said joint component is both rotatable through a specified range of free-motion rotation without torque transmission and is fixed from axial movement relative to one of said second shaft, the agricultural driving component of the agricultural machine and the agricultural driven component of the agricultural implement.

The Examiner relies upon the following as evidence of unpatentability:

Ferguson	US 4,551,115	Nov. 05, 1985
Walters	US 5,706,901	Jan. 13, 1998

Appellants seek review of the Examiner’s rejection of claims 1-11 as unpatentable over Walters in view of Ferguson. Appellants’ counsel, W.R. Duke Taylor, presented oral argument in this appeal on April 5, 2007.

The Examiner provides reasoning in support of the rejection in the Final Rejection (mailed September 2, 2004) and Answer (mailed June 2, 2005). Appellants present opposing arguments in the Brief (filed August 21, 2006) and Reply Brief (filed August 2, 2005).

### THE ISSUE

The dispositive issue in this appeal is whether the combined teachings of Walters and Ferguson would have suggested a drive shaft assembly as recited in claim 1 having a joint component of a universal joint that is rotatable through “a specified range of free-motion rotation without torque transmission” as called for in claim 1. Appellants contend that Ferguson, relied upon by the Examiner for a teaching of a joint component rotatable through “a specified range of free-motion rotation without torque transmission,” does not teach such (Br. 5 and Reply Br. 2).

### FINDINGS OF FACT

FF1. Walters appears to show a universal joint on either end of telescopic drive shaft 42 interconnecting the telescopic drive shaft 42 to the power take-off (PTO) shaft 18 of tractor 10 and the input shaft 44 of lower gear box 32 of transmission 26 of a towed and PTO-driven implement 22 (Walters, col. 2, ll. 34-35 and 47-49, and Fig. 1).

FF2. The Examiner concedes that Walters does not disclose a joint component of a universal joint being “rotatable through a specified range of free-motion rotation without torque transmission,” as called for in claim 1 (Final Rejection 3-4 and Answer 4).

FF3. The Examiner finds Ferguson teaches a joint component being rotatable through a specified range of free-motion without torque transmission and, on the basis of this finding, concludes that it would have been obvious to provide such a feature on Walters (Final Rejection 4 and Answer 4-5).

FF4. Ferguson does not disclose a joint component being rotatable through a specified range of free-motion *without torque transmission*. Ferguson discloses a drive member 10 comprising a yoke 12 for a conventional universal joint (Ferguson, col. 2, ll. 36-39) and a driven member 38 (Ferguson, col. 2, l. 54). The yoke has a stem 20 with four flat surfaces 22 (Ferguson, col. 2, ll. 46-47, Figs. 1 and 3) and the driven member 38 includes a primary section 40 having a square inner surface defined by four flat surfaces 42 (Ferguson, col. 2, ll. 56-58). Ferguson provides elastomer pads 56 between the flat surfaces 22 of drive member 10 and flat surfaces 42 of driven member 38, preferably under precompression so as to cause significant frictional engagement between the elastomer and surfaces 22 and 42 (Ferguson, col. 3, ll. 7-16, Fig. 3). Rotation of drive member 10 compresses the elastomer, thereby rotating driven member 38 and “establishing a torque transmitting relationship between the drive and driven members solely through the elastomer” (Ferguson, col. 3, ll. 41-44 and 51-55). An insert 58 is mounted on stem 20 and engages driven member 38 such that relative rotation between insert 58 and driven member 38 is prevented (Ferguson, col. 3, ll. 36-39). In the event of very high torque transmission forces being imposed on the coupling, the clearances between insert 58 and stem 20 (Fig. 4) are overcome by rotation of driven member 10, and its stem 20, relative to insert 58, thereby causing metal-to-metal

contact between stem 20 and insert 58 (Fig. 5) and transmitting torque to driven member 38 without further compressing the elastomer (Ferguson, col. 3, l. 64 to col. 4, l. 2). Even when “lost motion” occurs between the drive member 10 and driven member 38 (Ferguson, col. 4, ll. 4-7), torque is transmitted from drive member 10 to driven member 38 through the elastomer pads 56; driven member 38 rotates with drive member 10, though perhaps over a smaller rotation angle than drive member 10. Ferguson’s drive member 10 cannot rotate through any range of motion without transferring torque to driven member 38, either through elastomer pads 56 alone or through elastomer pads 56 and insert 58.

## ANALYSIS

The Examiner concedes that Walters lacks a joint component of a universal joint being “rotatable through a specified range of free-motion rotation without torque transmission,” as called for in claim 1 (FF2). Ferguson also lacks a joint component of a universal joint being “rotatable through a specified range of free-motion rotation without torque transmission” (FF4) and thus cannot make up for the conceded deficiency of Walters.

The Examiner erred in finding that Ferguson teaches a joint component being rotatable through a specified range of free-motion without torque transmission and consequently concluding that it would have been obvious to provide such a feature on Walters (FF3). The rejection of claim 1, and claims 2-11 depending from claim 1, cannot be sustained.

Appeal 2007-0422  
Application 09/943,685

**SUMMARY**

The decision of the Examiner to reject claims 1-11 is reversed.

**REVERSED**

hh

HARNESS, DICKEY & PIERCE, P.L.C.  
P.O. BOX 828  
BLOOMFIELD HILLS, MI 48303